

mm. latis; tubo ad 1.5 mm. longo a basi 0.7-0.8 mm. diametro sursum gradatim ampliato apice 1.2-1.4 mm. diametro; faucibus subapertis appendiculas invaginatias flavas puberulentas trapeziformes 0.2 mm. altas gerentibus; annulo evidente 5-lobato; antheris ellipticis 0.5-0.6 mm. longis supra medium tubi corollae gestis; nuculis homomorphis 0.8-1.2 mm. longis 0.7-0.9 mm. latis 0.3-0.4 mm. crassis, dorso ovatis convexis evidenter pallideque verrucosis marginem angulatum paulo incrassatum pallidum circumdatis, ventre obtusis; nuculo abaxillari subpersistenti; sulco nuculae de apice deorsum gradatim dilatato vel solum infra medium aperto nullo modo excavato; gynobasi anguste pyramidalis ca. 1 mm. alta nuculis brevioris basi 0.4-0.5 mm. crassa; stylo ad anthesin basis antherarum attingente, maturitate nuculas 0.5-0.7 mm. longe superante.

MEXICO: Nuevo Leon, on gypsum in open pine woods, 8 mi. south of Galeana, July 20, 1958, *D. S. Correll & I. M. Johnston 19872* (type, LL); open pine slope 4 mi. south of Pabillo, July 20, 1958, *Correll & Johnston 19901* (LL); gypsum flat in valley 3 mi. east of Highway No. 57 on road to Galeana, July 21, 1958, *Correll & Johnston 19906* (LL).

A very well marked species known only from the highlands of southern Nuevo Leon where it is apparently confined to gypsum or gypseous soils. In the field it was mistaken for a form of *C. albida* (HBK.) Johnston, the species with which it is probably most closely related. From *C. albida*, however, it is readily distinguished by its low spreading habit, loose dichotomous branching, larger corollas, long protruding style that much surpasses the nutlets, and dorsiventrally compressed nutlets with thickened pale angulate margins and non-excavate attachment-scar. Like *C. albida*, the present species appears to be a summer-flowering and not a spring-flowering plant. The specimens available have remnants of evidently crowded basal leaves. Some of the lowermost stems appear to be persisting portions of the stems of the season previous. The root also seems to be more than that of a seasonal annual and possibly may be that of a short-lived perennial.

CRYPTANTHA CRASSISEPALA (Torr.) Greene, *Pittonia* 1: 112. 1887.

Eritrichium crassisepalum Torrey, *Pacif. R. R. Survey Reports*, ed. 1, 2^d: 321. 1855, without description.

Eritrichium crassisepalum Torrey & Gray, *Pacif. R. R. Survey Reports*, ed. 2, 2^d: 171. 1857, description.

The name of this species was first published in 1855 in Torrey's report of the collections of Capt. Pope's expedition contained in the octavo first edition of the Pacific Railroad Survey Reports. Two lines of print were devoted to the species as follows: "*ERITRICHUM CRASSISEPALUM*, n. sp. With the preceding. A common species in Western Texas and New Mexico, but not hitherto described." The species preceding *E. crassisepalum* in the catalogue is *Lithospermum breviflorum*. Its source, and hence that of *E. crassisepalum* also, is given: "Gravelly soil, on the Pecos; April"

In the second, much more elaborate, quarto edition of Capt. Pope's Report, the botanical catalogue is authored by Torrey & Gray. Our species is provided with a description for the first time. Data concerning its geographic distribution and reference to collections made on the expedition are given as follows: "On the Pecos, Llano Estacado, etc.; in sandy soil; March. A common species in Western Texas and New Mexico. It was found by Frémont on the Upper Platte. It is the same as No. 640 of Fendler's New Mexican collection."

The type of *Eritrichium crassiseptum*, the collection made on Pope's expedition, is preserved at the New York Botanical Garden. The label with the type gives its source as: "Pecos River, Western Texas, Capt. Pope." Accordingly, not only the two original publications of the species, but also the type collection associate the plant with the Pecos River and Capt. Pope's expedition. With considerable justification, therefore, the Pecos River Valley has become generally accepted as the type locality for the species.

Unfortunately, *Eritrichium crassiseptum* as originally described by Torrey & Gray, was a mixture of two closely related species. These two, *Cryptantha crassiseptala* and *C. minima* were first distinguished by Johnston (Contr. Gray Herb. 74: 58-59. 1925), who selected the bractless southern and western plant as true *C. crassiseptala* and assigned the more northern bracteate plant of the Great Plains to *C. minima* Rydb. The type specimen of *C. crassiseptala* at New York consists of two plants of the bractless, *C. crassiseptala* and two of the bracteate *C. minima*. The Frémont collections mentioned when the species was originally described represents *C. minima*. The New Mexican collection (no. 640) of Fendler like the type of *C. crassiseptala* seems to be an equal mixture of true *C. crassiseptala* and *C. minima*.

A study of Capt. Pope's itinerary reveals that his expedition with Dr. W. L. Diffenderfer, who actually was the botanical collector, travelled easterly along Delaware Creek to its confluence with the Pecos River where a camp was established on March 8, 1854. Ten days later Pope and most of his party crossed the Pecos and began travelling southeasterly down the north side of the river through what is now Loving and Ward counties, Texas. On March 24th, when about 15 miles west of Grand Falls, the party turned away from the river and headed northeasterly for Big Spring, Howard County, where it arrived March 31st. In his report Pope refers to that area traversed between the Pecos River and Big Spring as part of the Llano Estacado. During the following month the party first went northwesterly from Big Spring to Sulphur Springs, Martin Co, and then turned northeasterly heading directly towards Fort Belknap in Young County. Accordingly, during March the party spent over two weeks in the Pecos Valley and less than a week on the southern portion of the Llano Estacado. During all of April the party was east of the Llano Estacado and crossing the red plains of north-central Texas.

The published data and that on the label with the type specimen, associate *Eritrichium crassiseptum* with the Pecos River which, as we can de-

termine from Pope's itinerary, must mean the 75 miles of the Pecos Valley in Loving and Ward counties, Texas. The collection must have been made in March. This data seems trustworthy, at least so far as it concerns the bractless plants in the mixed type of the species. These represent a recognizable geographic form of true *C. crassisejala* with large corollas, which I have seen only from this section of the Pecos Valley and areas directly adjacent, in Ward, Winkler, Crane and Upton counties. The source of the other material in the mixed type of *E. crassisejalum* is not readily determined. This bracteate plant, referable to *C. minima* Rydb., is primarily a northern species which merely reaches its southern limit in the Pecos Valley and is rare and erratic in occurrence so far south. In the general region traversed by Pope it has been collected near Pyote, Ward Co., near Girvin, Pecos Co. and near Big Spring, Howard Co. Possibly the Expedition may have met the species while travelling between the Pecos and Big Spring. Were this the case the mention of Llano Estacado when *E. crassisejalum* was described would be understandable.

The two geographic varieties of *Cryptantha crassisejala* may be distinguished as follows:

***Cryptantha crassisejala* (Torr.) Greene var. *typica* Johnston, var. nov.**

Planta grandiflora; corolla 4.5 mm. longa quam calyce evidenter longiore; limbo 3-5 mm. diametro; lobis 1.5 mm. diametro; tubo 1.7-2 mm. longo; antheris 0.5 mm. longis ca. 1.2 mm. supra basin corollae affixis.

TEXAS: Crane Co., 6-14 mi. west of Crane, May 4, 1957, *Warnock & Mullins 14429 & 14433* (LL). Ward Co., 7 mi. west-southwest of Monahans, May 5, 1947, *McVaugh 8176* (LL, TEX); 3 mi. nw. of Monahans, sandy, May 4, 1946, *Cory 51964* (US); east of Pyote, April 17, 1941, *Lundell 10257* (LL); north of Pyote, April 30, 1942, *Lundell 11390* (LL). Winkler Co., east of Kermit, dunes, April 30, 1942, *Lundell 11397* (LL); 10 mi. east of Kermit, dunes, May 13, 1957 *Correll 16355* (LL). Upton Co., 3 mi. west of McCamey, April 16, 1941, *Lundell 10228* (LL, US). Indefinite: Pecos River, Western Texas, *Capt. Pope* in pt., mixed with *C. minima* (type, NY).

This typical form of the species is known only from sandy places in the Pecos Valley and just north of it, in Ward, Crane, Upton and Winkler counties, Texas.

***Cryptantha crassisejala* (Torr.) Greene var. *elachantha* Johnston, var. nov.**

Planta parviflora; corolla 3 mm. longa calyce vix longiore inconspicua; limbo 2.5 mm. diametro; lobis 0.6-0.8 mm. diametro; tubo 1.5 mm. longo; antheris 0.4 mm. longis 1 mm. supra basin corollae affixis.

TEXAS: Jeff Davis Co., Apr. 20, 1932, *Whitehouse 8357* (TEX); 3 mi. northwest of Chispa, March 18, 1941, *Warnock & Rose-Innes 481* (TEX). Brewster Co., Alpine, Sul Ross College campus, Aug. 12, 1936 *Warnock T. 178* in pt., mixed with *C. mexicana* (TEX); 0-2 Ranch [about 40 mi.] south of Alpine, March 26, 1929,

A. B. Clawson 29-113 in pt., mixed with *C. mexicana* (LL); hills about mouth of Santa Elena Canyon, Big Bend, March 16, 1947, *Warnock* 47040 (LL). Culberson Co., just south of Van Horn, Apr. 5, 1936, *Sperry* T. 65 (US); Van Horn Mts., April 15, 1949, *Tharp & Harvard* 49309 (TEX); betw. Van Horn and Sierra Blanca, May 8, 1938, *Warnock* T. 350 (US). Hudspeth Co., Quitman Range, Apr. 23, 1938, *H. E. Wheeler* (LL); igneous north end of Quitman Mts., 8 mi. west of Sierra Blanca, April 21, 1947, *McVaugh* 8040 (type LL, TEX). El Paso Co., Fabens, Apr. 10, 1930, *M. E. Jones* 25815 (POM); El Paso, 1881, *G. R. Vasey* (NY); El Paso, 1858, *Dieffenderfer* 79 (PH); El Paso, March 20, 1932, *Whitehouse* 8354 (TEX); McKelligon Canyon, El Paso, March 26, 1948, *Warnock* 7061 (LL, TEX); Mt. Franklin, El Paso, April 19, 1952, *Warnock* 10386 (LL); slopes of Mt. Franklin, 2 mi. west of El Paso, April 10, 1952 *Warnock* 10310 (LL).

Only Texas collections of the variety are cited. From Trans-Pecos Texas the var. *elachantha* extends westward through New Mexico into Arizona and thence southward into northern Mexico and northward into southern Utah and southwestern Colorado. It is the most common and most widely ranging form of *C. crassisepala*.

CRYPTANTHA MINIMA Rydb., Bull. Torr. Bot. Cl. 28: 31. 1901; Johnston, Contr. Gray Herb. 74: 58. 1925.

Eritrichium hispidum Buckley, Proc. Acad. Philad. 1861: 462. 1861, not *Cryptantha hispida* (Phil.) Reiche, 1908.

In the past Buckley's *Eritrichium hispidum* has been identified with *Cryptantha texana* (DC.) Greene or more commonly with *C. albida* (HBK.) Johnston. The type of *E. hispidum* was recently reexamined at Philadelphia. Without doubt, it represents the bracteate generally northern relative of *C. crassisepala* to which the name *C. minima* Rydb. is properly applicable!

The type collection of *E. hispidum* is given by S. B. Buckley as collected "on the Upper Colorado of Texas" in June, of either 1860 or 1861. According to Buckley (First Annual Report of Geol. & Agric. Survey of Texas, pp. 8 and 10. 1874), during June 1860 he was working in Navarro County, Texas where the present species is most certainly neither known nor to be expected! The following year, from early March to mid June he was traveling on geological reconnaissance in central and north central Texas. His return route was south from Clay and Archer counties along the Permian-Pennsylvanian contact. He crossed the Colorado River between Coleman and McCulloch counties and, after a few days in Mason and Maynard counties, travelled directly to Austin, reaching there by mid-June. Accordingly, the type of *E. hispidum* must have been collected early in June 1861 near the crossing of the Colorado River in either Coleman or McCulloch county. This represents a southeastern extension in the generally recognized range of the species. This extension, however, is not inconsistent with the known distribution of *C. minima* and should be a cause for no great surprise. The species has heretofore been recognized as reaching its southeastern limit within Texas in Archer, Fisher, Mitchell and Val Verde counties.